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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,610	10/20/2003	Masatoshi Yumoto	Q78027	2613

23373 7590 12/14/2005
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EXAMINER

FEELY, MICHAEL J

ART UNIT PAPER NUMBER

1712

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/687,610

Applicant(s)

YUMOTO ET AL.

Examiner

Michael J. Feely

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-7 and 11-20 is/are rejected.
- 7) ☒ Claim(s) 2 and 8-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0104.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

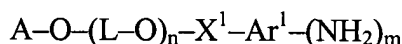
2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3-7, 11-17, 19, and 20 rejected under 35 U.S.C. 102(b) as being anticipated by Baron (US Pat. No. 4,328,322).

Regarding claims 1 and 3-7, Baron discloses: *(I)* a polyether derivative represented by the following general formula (I):



(column 4, lines 9-40; Examples, claims) wherein, in the general formula (I):

- X^1 represents $-CO-$ or $-SO_2-$; (column 4, lines 9-40; Examples, claims)
- Ar^1 represents unsubstituted arylene or arylene substituted with a halogen atom, or an alkyl, alkenyl, alkynyl, alkoxy, alkoxycarbonyl, aryloxycarbonyl or cyano group; (column 4, lines 9-40; Examples, claims)
- L represents alkylene; (column 4, lines 9-40; Examples, claims)
- m is 1 or 2; (column 4, lines 9-40; Examples, claims)

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- A represents $-X^2-Ar^2-(NH_2)_l$, a hydrogen atom, or an alkyl, aryl or acyl group, wherein X^2 , Ar^2 , and l have the same meanings as the above-mentioned X^1 , Ar^1 and m , respectively (column 4, lines 9-40; Examples, claims); and
- n is an average addition mole number of a polyether group and is a numerical value of 10 to 500 (column 4, lines 9-40; Examples, claims);

(3) wherein Ar^1 in the general formula (I) has 6 to 30 carbon atoms in all (column 4, lines 9-40; Examples, claims);

(4) wherein $-X^1-Ar^1-(NH_2)_m$ in the general formula (I) is a 4-aminobenzoyl, 3,5-diaminobenzoyl or 4-aminobenzensulfonyl group (column 4, lines 9-40; Examples, claims);

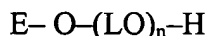
(5) wherein L in the general formula (I) is alkylene having 2 to 20 carbon atoms in all (column 4, lines 9-40; Examples, claims);

(6) wherein L in the general formula (I) is selected from the group consisting of ethylene, propylene, tetramethylene, phenylethylene, cyclohexylene, vinyl ethylene and phoxymethylene (column 4, lines 9-40; Examples, claims); and

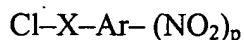
(7) wherein repeating unit $-(L-O)_n$ in the general formula (I) is selected from the group consisting of polyethylene oxide, polypropylene oxide, polytetramethylene oxide, polystyrene oxide, polycyclohexylene oxide, polyethylene oxide-polypropylene oxide block copolymer, and polyethylene oxide-polypropylene oxide random copolymer (column 4, lines 9-40; Examples, claims).

Regarding claims 11-17, 19, and 20, Baron discloses: (II) a process for producing a polyether derivative, comprising: (1) causing a polyether derivative represented by the following general formula (II):

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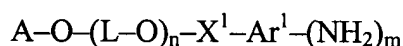
to react with an aromatic nitro compound represented by the following general formula (III):



(column 4, lines 9-40; column 21, lines 26-63) wherein in the general formulae (II) and (III):

- E represents a hydrogen atom or an alkyl, aryl or acyl group (column 4, lines 9-40; column 21, lines 26-63);
- X represents X^1 or X^2 (column 4, lines 9-40; column 21, lines 26-63);
- Ar represents Ar^1 or Ar^2 (column 4, lines 9-40; column 21, lines 26-63);
- p represents m or l (column 4, lines 9-40; column 21, lines 26-63);
- L represents alkylene (column 4, lines 9-40; column 21, lines 26-63); and
- n is an average addition mole number of a polyether group, and is a numerical value of 10 to 500 (column 4, lines 9-40; column 21, lines 26-63);

(2) carrying out hydrogen reduction in the presence of a catalyst for catalytic hydrogen reduction to thereby yield a polyether derivative represented by the following general formula (I):



(column 4, lines 9-40; column 21, lines 26-63) wherein, in the general formula (I):

- X^1 represents $-CO-$ or $-SO_2-$; (column 4, lines 9-40; Examples, claims)
- Ar^1 represents unsubstituted arylene or arylene substituted with a halogen atom, or an alkyl, alkenyl, alkynyl, alkoxy, alkoxycarbonyl, aryloxycarbonyl or cyano group; (column 4, lines 9-40; Examples, claims)
- L represents alkylene; (column 4, lines 9-40; Examples, claims)

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- m is 1 or 2; (column 4, lines 9-40; Examples, claims)
- A represents $-X^2-Ar^2-(NH_2)_l$, a hydrogen atom, or an alkyl, aryl or acyl group, wherein X^2 , Ar^2 , and l have the same meanings as the above-mentioned X^1 , Ar^1 and m, respectively (column 4, lines 9-40; Examples, claims); and
- n is an average addition mole number of a polyether group and is a numerical value of 10 to 500 (column 4, lines 9-40; Examples, claims);

(12) wherein an amount of the aromatic nitro compound (III) used is from 1.0 to 3.0 moles per mole of hydroxyl groups of the polyether derivative (II) (column 4, lines 9-40; column 21, lines 26-63);

(13) wherein for the reaction between the polyether derivative (II) and the aromatic nitro compound (III), a base selected from the group consisting of triethylamine, pyridine, DBU and sodium hydroxide is used (column 4, lines 9-40; column 21, lines 26-63); (14) wherein an amount of the base used is from 1.0 to 3.0 moles per mole of hydroxyl groups of the polyether derivative (II) (column 4, lines 9-40; column 21, lines 26-63);

(15) wherein for the reaction between the polyether derivative (II) and the aromatic nitro compound (III), a solvent selected from the group consisting of toluene, acetonitrile, tetrahydrofuran and methylene chloride is used (column 4, lines 9-40; column 21, lines 26-63);

(16) wherein the amount of solvent used is from 0.5 to 50 ml per gram of the polyether derivative (II) (column 4, lines 9-40; column 21, lines 26-63);

(17) wherein the reaction between the polyether derivative (II) and the aromatic nitro compound (III) is conducted at a temperature of 0 to 100°C or at a reflux temperature of a solvent used (column 4, lines 9-40; column 21, lines 26-63);

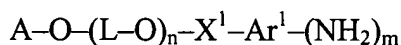
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(19) wherein a solvent selected from the group consisting of methanol, ethanol, 2-propanol, tetrahydrofuran, and chloroform is used for the hydrogen reduction (column 4, lines 9-40; column 21, lines 26-63); and

(20) wherein the hydrogen reduction is conducted at a temperature of 0 to 60°C or at a reflux temperature of a solvent used (column 4, lines 9-40; column 21, lines 26-63).

4. Claims 1, 3-7, 11, 12, 15-17, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Fuller et al. (US Pat. No. 4,829,099).

Regarding claims 1 and 3-7, Fuller et al. disclose: (1) a polyether derivative represented by the following general formula (I):



(Abstract; column 4, line 65 through column 7, line 8; column 15, line 51 through column 16, line 32) wherein, in the general formula (I):

- X^1 represents $-CO-$ or $-SO_2-$ (Abstract; column 4, line 65 through column 7, line 8);
- Ar^1 represents unsubstituted arylene or arylene substituted with a halogen atom, or an alkyl, alkenyl, alkynyl, alkoxy, alkoxy carbonyl, aryloxy carbonyl or cyano group (Abstract; column 4, line 65 through column 7, line 8);
- L represents alkylene (Abstract; column 4, line 65 through column 7, line 8);
- m is 1 or 2 (Abstract; column 4, line 65 through column 7, line 8);
- A represents $-X^2-Ar^2-(NH_2)_l$, a hydrogen atom, or an alkyl, aryl or acyl group, wherein X^2 , Ar^2 , and l have the same meanings as the above-mentioned X^1 , Ar^1 and m, respectively (Abstract; column 4, line 65 through column 7, line 8); and

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- n is an average addition mole number of a polyether group and is a numerical value of 10 to 500 (Abstract; column 4, line 65 through column 7, line 8);

(3) wherein Ar^1 in the general formula (I) has 6 to 30 carbon atoms in all (Abstract; column 4, line 65 through column 7, line 8);

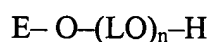
(4) wherein $-\text{X}^1-\text{Ar}^1-(\text{NH}_2)_m$ in the general formula (I) is a 4-aminobenzoyl, 3,5-diaminobenzoyl or 4-aminobenzensulfonyl group (Abstract; column 4, line 65 through column 7, line 8);

(5) wherein L in the general formula (I) is alkylene having 2 to 20 carbon atoms in all (Abstract; column 4, line 65 through column 7, line 8);

(6) wherein L in the general formula (I) is selected from the group consisting of ethylene, propylene, tetramethylene, phenylethylene, cyclohexylene, vinyl ethylene and phenoxymethylethylene (Abstract; column 4, line 65 through column 7, line 8); and

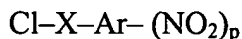
(7) wherein repeating unit $-(\text{L}-\text{O})_n$ in the general formula (I) is selected from the group consisting of polyethylene oxide, polypropylene oxide, polytetramethylene oxide, polystyrene oxide, polycyclohexylene oxide, polyethylene oxide-polypropylene oxide block copolymer, and polyethylene oxide-polypropylene oxide random copolymer (Abstract; column 4, line 65 through column 7, line 8).

Regarding claims 11, 12, 15-17, and 20, Fuller et al. disclose: (II) a process for producing a polyether derivative, comprising: (1) causing a polyether derivative represented by the following general formula (II):



to react with an aromatic nitro compound represented by the following general formula (III):

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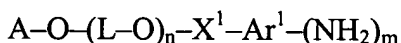


(column 4, line 65 through column 7, line 8; column 15, line 51 through column 16, line 32)

wherein in the general formulae (II) and (III):

- E represents a hydrogen atom or an alkyl, aryl or acyl group (column 4, line 65 through column 7, line 8; column 15, line 51 through column 16, line 32);
- X represents X^1 or X^2 (column 4, line 65 through column 7, line 8; column 15, line 51 through column 16, line 32);
- Ar represents Ar^1 or Ar^2 (column 4, line 65 through column 7, line 8; column 15, line 51 through column 16, line 32);
- p represents m or l (column 4, line 65 through column 7, line 8; column 15, line 51 through column 16, line 32);
- L represents alkylene (column 4, line 65 through column 7, line 8; column 15, line 51 through column 16, line 32); and
- n is an average addition mole number of a polyether group, and is a numerical value of 10 to 500 (column 4, line 65 through column 7, line 8; column 15, line 51 through column 16, line 32);

(2) carrying out hydrogen reduction in the presence of a catalyst for catalytic hydrogen reduction to thereby yield a polyether derivative represented by the following general formula (I):



(Abstract; column 4, line 65 through column 7, line 8; column 15, line 51 through column 16, line 32) wherein, in the general formula (I):

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- X^1 represents $-\text{CO}-$ or $-\text{SO}_2-$ (Abstract; column 4, line 65 through column 7, line 8);
- Ar^1 represents unsubstituted arylene or arylene substituted with a halogen atom, or an alkyl, alkenyl, alkynyl, alkoxy, alkoxycarbonyl, aryloxy carbonyl or cyano group (Abstract; column 4, line 65 through column 7, line 8);
- L represents alkylene (Abstract; column 4, line 65 through column 7, line 8);
- m is 1 or 2 (Abstract; column 4, line 65 through column 7, line 8);
- A represents $-\text{X}^2-\text{Ar}^2-(\text{NH}_2)_l$, a hydrogen atom, or an alkyl, aryl or acyl group, wherein X^2 , Ar^2 , and l have the same meanings as the above-mentioned X^1 , Ar^1 and m, respectively (Abstract; column 4, line 65 through column 7, line 8); and

n is an average addition mole number of a polyether group and is a numerical value of 10 to 500 (Abstract; column 4, line 65 through column 7, line 8);

(12) wherein an amount of the aromatic nitro compound (III) used is from 1.0 to 3.0 moles per mole of hydroxyl groups of the polyether derivative (II) (column 15, line 51 through column 16, line 32);

(15) wherein for the reaction between the polyether derivative (II) and the aromatic nitro compound (III), a solvent selected from the group consisting of toluene, acetonitrile, tetrahydrofuran and methylene chloride is used (column 15, line 51 through column 16, line 32);

(16) wherein the amount of solvent used is from 0.5 to 50 ml per gram of the polyether derivative (II) (column 15, line 51 through column 16, line 32);

(17) wherein the reaction between the polyether derivative (II) and the aromatic nitro compound (III) is conducted at a temperature of 0 to 100°C or at a reflux temperature of a solvent used (column 15, line 51 through column 16, line 32); and

(20) wherein the hydrogen reduction is conducted at a temperature of 0 to 60°C or at a reflux temperature of a solvent used (column 15, line 51 through column 16, line 32).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baron (US Pat. No. 4,328,322) or Fuller et al. (US Pat. No. 4,829,099).

Regarding claim 18, neither Baron nor Fuller et al. disclose (18) wherein the polyether derivative (II) is dehydrated before the reaction, and then used. However, this appears to be merely a purification step of the reactant to ensure the most efficient reaction and the purest reaction product as possible. In the absence of unexpected results it would have been obvious to perform the instantly claimed process with or without the purification step – *see MPEP 2144.04 VII*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the dehydration of polyether derivative (II) prior to reaction in Baron or Fuller et al. because this step is merely a means of purification to ensure the most efficient reaction and the purest reaction product as possible.

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Allowable Subject Matter

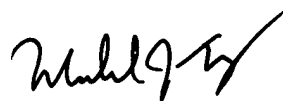
7. Claims 2 and 8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is 571-272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael J. Feely
Primary Examiner
Art Unit 1712

December 9, 2005

**MICHAEL FEELY
PRIMARY EXAMINER**